Isoil Industria
a worldwide supplier of electromagnetic flowmeters

Total flow control. Accurate to the drop.

ISOMAG®

The friendly magmeter

THE IDEAL FLOWMETERS FOR ANY APPLICATION

- from DN03 to DN2400
- wide range of process connections
- battery powered system
- GPRS wireless communication

CONVERTERS	ML4F1	ML 51	ML 110
			
Description	Fast Sampling Rate Converter (up to 400Hz)	4/20 mA Loop Powered Converter	Digital Converter
Enclosure	Stainless Steel AISI 304 (opt. AISI 316)	Nylon with Glass Fiber Opt. Aluminium Die Casting	Nylon with Glass Fiber Opt. Aluminium Die Casting (pictured)
Display	No	2 lines x 16 characters	2 lines x 16 characters
Protection Rate	IP 67	IP 65 / IP 67	IP 65 / IP 67
Outputs / Inputs	1 digital output max 1250Hz Profibus / RS485 (opt.) 1 current output, passive (opt.) 5 digital input/output	1 digital output + 1 digital input + 4/20 mA two wire system	1 current output 2 digital output max 1250Hz Others on request (see additional modules)
Special Functions	Bidirectional, Dual Range, Diagnostic, Empty Pipe, Batch	Bidirectional, Diagnostic, Empty Pipe	Bidirectional, Dual Range, Diagnostic, Empty Pipe
Power Supply	10-33 Vdc	10-33 Vdc two wire	90-265Vac / 45-60Hz 10-63Vdc 15-45Vac / 45-66Hz
Accuracy class	± 0,2% of measured value	± 0,5% of measured value	± 0,8% (± 0,4% on request) of measured value
Repeatability	Better then 0.1%	± 0,5%	± 0,2%
Temperature	–20…+60°C	–20…+70°C	–10…+50°C

SENSORS	MS 501 - MS 600	MS 1000	MS 5000
			
Description	"Microflow" Sensor	"Wafer" Sensor	Patented Wrapper Plastic Sensor
Body Material	Stainless Steel AISI304 (MS 501); Polypropylene (MS 600)	Carbon Steel Stainless Steel AISI304 (316 on request)	Polyurethane
Diameter (mm)	DN 3 ÷ 20	DN 25 ÷ 400	DN 20 ÷ 80
Pressure (bar)	PN 16, PN 40 on request	PN 16, PN 40 for PTFE	PN 6
Temperature	–20 ÷ 100 °C (PTFE/compact) –20 ÷ 130 °C (PTFE/remote) 0 ÷ 60 °C (Polypropylene liner)	0 ÷ 60 °C (Polypropylene liner) –5 ÷ 80 °C (Ebonite liner) –20 ÷ 100 °C (PTFE/compact) –20 ÷ 110 °C (PTFE/remote)	0 ÷ 50 °C
Connection	Threaded; Flanged; Sanitary DIN11851; Tri-clamp; Tri-clover, SMS…	Wafer	Metallic wrapper
Liner	PTFE, Polypropylene	Polypropylene, Ebonite, PTFE, others on request	Polyurethane
Electrodes	Stainless Steel AISI316L; Hastelloy C; Platinum, Tantalum, Titanium, etc…		
Protection Rate	IP68 for all sensors in separate version, for compact sensors depending on protection rate of converter connected		
Accuracy class	Depending on converter		± 2% of measured value

- high speed converter
- HP version up to 250 bar
- energy meter
- 3A sanitary approval
- MID-MI004 (EN1434) approval
- MID-MI001 & OIML R49 approvals

	ML 210 – ML 211	ML 145 – ML 252	ML 255
			
	Graphic Converter Energy Meter (ML 211)	Battery Powered Converter	Battery Powered Converter
	Aluminium Die Casting Stainless Steel on request	Aluminium Die Casting Stainless Steel on request	Aluminium Die Casting Stainless Steel on request
	Graphic display 128x64 pixels, 8 lines x 16 characters, with back light	2 lines x 16 characters Blind version (ML 252)	Graphic display 128x64 pixels, 8 lines x 16 characters
	IP 67	IP 67 / IP 68	IP 67 / IP 68
	1 current output (+ 1 opt.) 2 digital output max 1250Hz (opt. at 12,5KHz); 1 digital input Others on request (see additional modules)	2 digital output + 1 digital input (opt.) 1 current output (with external power supply only ML 145)	2 digital output + 1 digital input (opt.) Others on request (see additional modules)
	Bidirectional, Dual Range, Diagnostic, Empty Pipe, Batch	Bidirectional, Diagnostic, Energy Saving, Empty Pipe, Data Logger	Bidirectional, Diagnostic, Energy Saving, Empty Pipe, Data Logger, GPRS, BIV (Built In Verificator), DAT card
	90-265Vac / 45-60Hz 10-63Vdc 15-45Vac / 45-66Hz 10-35Vdc	Lithium Battery (up to 6 batteries) + DC or solar panel (ML 145) 2 lithium battery (ML 252)	Lithium Battery (up to 6 batteries) + AC/DC or solar panel
	± 0,2% of measured value	± 0,5% of measured value*	± 0,4% of measured value*
	Better then 0.1%	Better then 0.4%	± 0,4%
	–20…+60°C	–20…+60°C	–20…+60°C

	MS 2410	MS 2500	MS 3770 - MS 3810
			
	"Sanitary" Sensor for Food/Pharmaceutical Applications	"Flanged" Sensor	"Insertion" Sensor with or without Isolation Ball Valve
	Stainless Steel AISI304 Stainless Steel AISI316 (on request)	Carbon Steel Stainless Steel AISI304/316 (on request)	Probe in Stainless Steel AISI304 (MS 3770); 316 on request Probe in Stainless Steel AISI316 (MS 3810)
	DN 3 ÷ 100	DN 25 ÷ 2400	DN80 ÷ DN8000 Others on request
	PN 16 / PN 25 on request	PN 16, others on request	PN 16 others on request (MS 3770) - PN 25 (MS 3810)
	–20 ÷ 100 °C (compact) 130° with ML4F1 –20 ÷ 150 °C (remote)	0 ÷ 60 °C (Polypropylene) 0 ÷ 70 °C (Rilsan) –5 ÷ 80 °C (Ebonite) –20 ÷ 100 °C (PTFE/compact) –20 ÷ 110 °C (PTFE/remote) –20 ÷ 180 °C (PTFE HT/remote)	0 ÷ 100 °C (compact) 0 ÷ 130 °C (remote) only for MS 3770
	Sanitary DIN11851; Tri-clamp; Tri-clover; SMS etc…	Flanges: UNI, ANSI, DIN, JIS, etc…	1" G or NPT threaded end Others on request
	PTFE	Polypropylene, Ebonite, PTFE, Rilsan etc.	PTFE (MS 3770) PEEK (MS 3810)
	Stainless Steel AISI316L; Hastelloy C; Platinum, Tantalum, Titanium, etc…		Stainless Steel AISI316L Others on request
	Depending on converter		± 2% of measured value*

*Higher accuracies, also at low flow rates, can be reached with special calibrations.

SENSORS-CONVERTERS COUPLINGS

Sensor Model	ML 51	ML 110	ML 210 ML 211	ML 145	ML 800 *	ML 255	ML 252 *	ML 4F1 *
MS 501/600	●	●	●	●		●	●	●
MS 1000	●	●	●	●	●	●	●	●
MS 2410	●	●	●	●		●	●	●
MS 2500	●	●	●	●	●	●	●	●
MS 3810	●	●	●	●		●	●	
MS 3770	●	●	●	●		●	●	
MS 5000 'CIAO'	●	●		●	●			

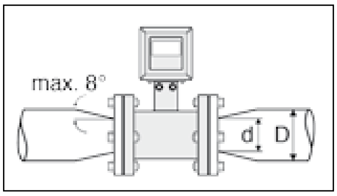
Converter Model

* Blind version only.

Additional I/O Modules for Converters	ML 51	ML 110	ML 210 ML 211	ML 145	ML 800 *	ML 255	ML 252 *	ML 4F1 *
2 additional outputs (n.1 at 12,5 KHz)			●					●
Serial Interface RS 485		●	●					●
Serial interface RS 232			●			●	●	
Modbus		●	●					
GPRS module						●		
Profibus DP			●					●
HART			●					
1 0/4–20 mA output + n.2 On/Off prog. Outputs + n. 1 ON/OFF input			●	●	●			
1 RS232 serial interface + n.1 0/4–20 mA + n.2 On/Off prog. outputs			●					
2 relay outputs (each with 1 NO/NC contact, 2A – 250 Vac, 60W 125V)			●					
2 PT100 input + 1 additional 0/4–20 mA output + n.1 ON/OFF input + 1 ON/OFF output (programmable function)			● ML211					
4–20 mA output	●	●	●	●	●			●
2 pressure or level inputs 1 pressure or level input + 1 CPM input						●		

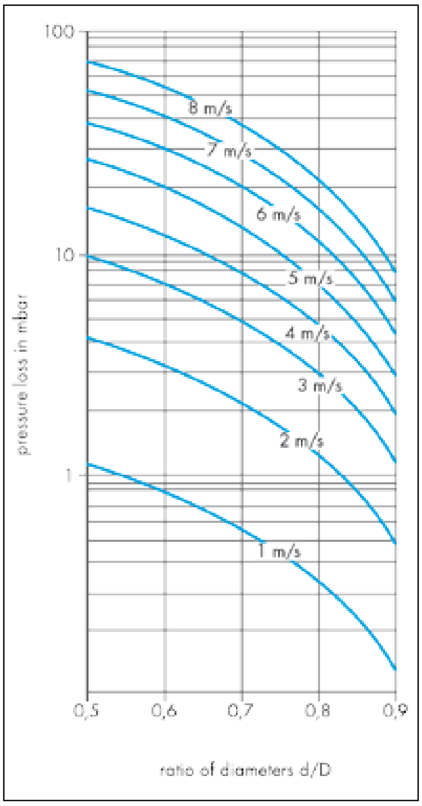
NOMINAL FLOWS

DN	Min full scale v=0,4 m/s		Max full scale v=10 m/s	
3	0	10 l/h	0	250 l/h
6	0	40 l/h	0	1000 l/h
10	0	120 l/h	0	2800 l/h
15	0	240 l/h	0	6000 l/h
20	0	500 l/h	0	11500 l/h
25	0	0,72 m^3/h	0	18 m^3/h
32	0	1,16 m^3/h	0	29 m^3/h
40	0	1,80 m^3/h	0	45 m^3/h
50	0	2,88 m^3/h	0	72 m^3/h
65	0	4,80 m^3/h	0	120 m^3/h
80	0	7,20 m^3/h	0	180 m^3/h
100	0	11,20 m^3/h	0	280 m^3/h
125	0	18,00 m^3/h	0	450 m^3/h
150	0	25,60 m^3/h	0	640 m^3/h
200	0	45,20 m^3/h	0	1130 m^3/h
250	0	70,80 m^3/h	0	1770 m^3/h
300	0	100,80 m^3/h	0	2520 m^3/h
350	0	138,00 m^3/h	0	3450 m^3/h
400	0	180,00 m^3/h	0	4500 m^3/h
450	0	228,80 m^3/h	0	5720 m^3/h
500	0	284,00 m^3/h	0	7100 m^3/h
600	0	408,00 m^3/h	0	10200 m^3/h
700	0	560,00 m^3/h	0	14000 m^3/h
800	0	720,00 m^3/h	0	18000 m^3/h
900	0	920,00 m^3/h	0	23000 m^3/h
1000	0	1140,00 m^3/h	0	28500 m^3/h
1200	0	1600,00 m^3/h	0	40000 m^3/h
1400	0	2200,00 m^3/h	0	55000 m^3/h
1600	0	2880,00 m^3/h	0	72000 m^3/h
1800	0	3640,00 m^3/h	0	91000 m^3/h
2000	0	4520,00 m^3/h	0	113000 m^3/h
2400	0	6400,00 m^3/h	0	160000 m^3/h



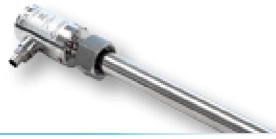
Procedure

Determine the d/D ratio, velocity range, and calculate the pressure loss on the monogram.



COMPACT SOLUTIONS: CONVERTER + SENSOR

Model Type	MS 3900
Description	Ultracompact flowmeter
Body Material	PTFE coated zinked Steel
DN	10/15/20/32/40/50 mm
Pressure	1600 KPa
Medium temperature	–10 °C to 100 °C
Ambient temperature	–10 °C to 60 °C
Connection	Thread male UNI 338/NPT
Liner	PTFE
Electrodes	Stainless Steel AISI316L
Protection Rate	IP67
Display	No
Ouput/Inputs:	N. 2 ouputs for Volume/alarms; N. 1 freely programmed as input or output N. 1 current output
Temperature measurement	–10 °C to 100 °C, accuracy ±2 °C
Power supply	18-30 VDC
Accuracy class	±1,5% of measured value



Model Type	ML 800
Description	Compact converter
Suitable for	MS1000 – MS2500 – MS5000
Material	Aluminium, AISI 304 on request
DN	up to DN 300
Medium temperature	0 °C to 100 °C
Ambient temperature	–20 °C to 60 °C
Protection rate	IP67
Display	No
Ouput/Inputs:	1 channel freely programmable as INPUT or OUTPUT for volume pulses/alarms
Special features	1 additional digital output; 4–20 mA
Power supply	18-30 VDC
Accuracy class	±0,8% of measured value

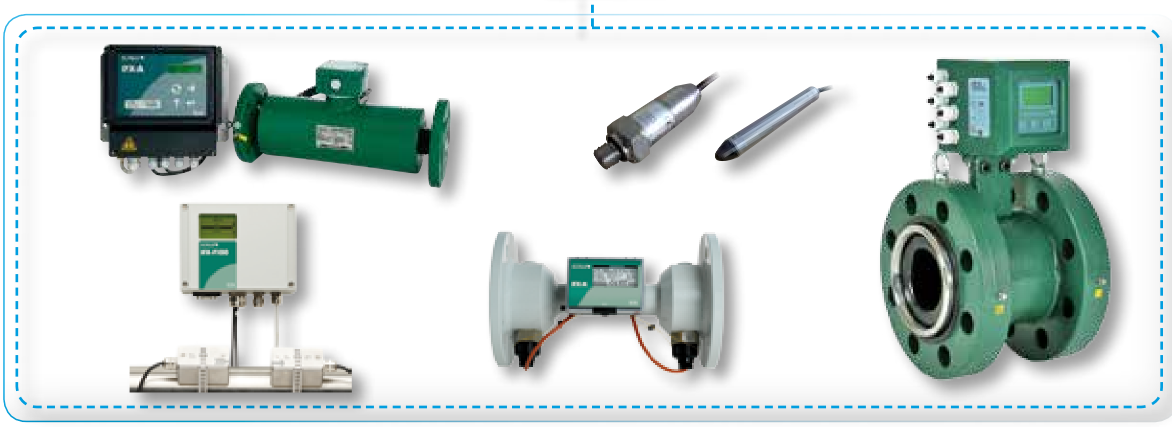
Model Type	MS 3790
Description	Ultracompact insertion Flowmeter
Material	AISI 304 full construction
DN	from DN 65
Medium temperature	0 °C to 100 °C
Ambient temperature	–10 °C to 60 °C
Protection rate	IP67
Display	No
Ouput/Inputs:	N. 1 channel freely programmable as INPUT or OUTPUT for volume pulses/alarms
Special features	1 additional digital output; 4–20 mA
Power supply	18-30 VDC
Accuracy class	±2% of measured value

ML 155 DATA LOGGER

ML 155 is a battery operated powerful universal data logger with integrated GPRS.

The instrument is designed to be integrated to, or to retrofit, meters which do not have a GPRS transmission.

The instrument can log up to 3 external signals in different combinations and also drive 2 pressure/level sensors or CPM (Corrosion Protection Module).



IN SITU VERIFICATION

ISOCAL – Completely automatized flow meter advanced check up, measures the electrical conditions of the sensor and compares the results with the reference stored.

Full verification of all converter I/O.

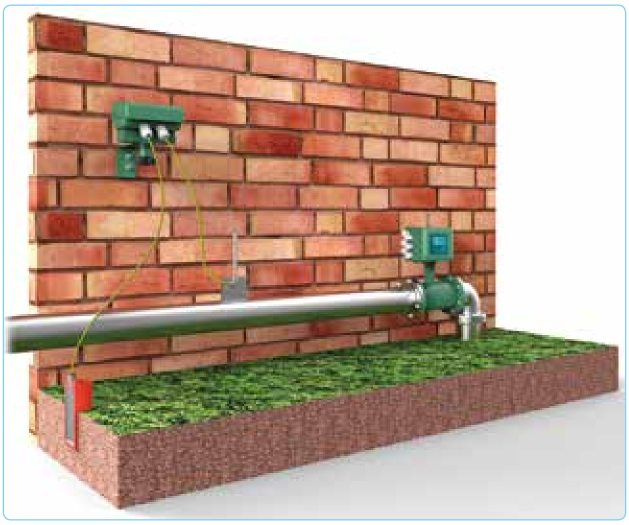
Emission of report with reference and actual data.

ISOCHECK – Flow simulator is a simple device to be connected to ML 110 or ML 210 converters, making a verification of the electrical and measurement characteristics of the converter.

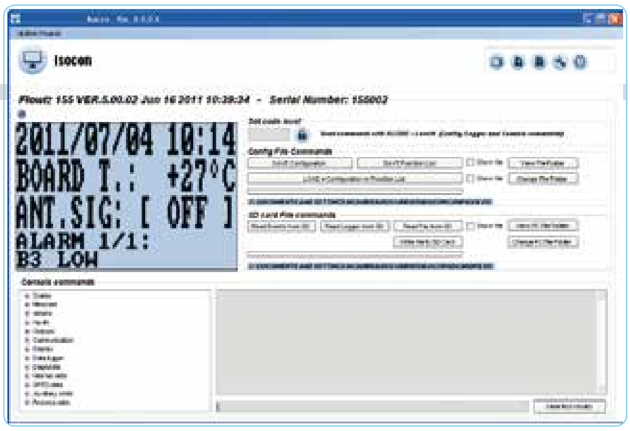
BIV – Built in verificator, on request for ML 255, consists in a software that automatically and periodically makes a check of the vital electrical characteristics of the sensor, sending an alarm in case of result outside specification and generating a printable report.

ACCESSORIES

IF2 CABLE – Cable to connect all ISOMAG meters to a laptop, including ISOCON sosftware.



CPM – Corrosion Protection Module additional measuring module able to continuously monitor the electrical potential of the line, giving to user real time information on cathodic protection efficiency.
For ML 255 and ML 155.



ISOCON – User friendly interface software for an easy access to all meters programmable functions.

PREAMPLIFIER – Useful tool to be mounted on top of the meter when converter must be placed far from a sensor. Maximum distance 500 meters (1640 ft.). It works with ML 210 only.

SEPARATION KIT – Several kits for the transformation of the instruments from compact to separate and vice versa.

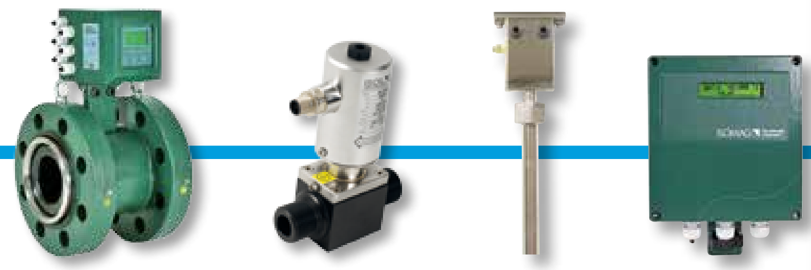
APL – Solar panel with external accumulator and electronic for power management, suitable for battery converters.

THE RIGHT FLOWMETER FOR YOUR APPLICATION

	Converter Model									Sensors									
Water & Wastewater	ML 51	ML 110	ML 210	ML 211	ML 145	ML 255	ML 252	ML 4F1	ML 800	MS 501	MS 600	MS 1000	MS 2410	MS 2500	MS 3770	MS 3790	MS 3810	MS 3900	MS 5000
Water distribution	●	●	●		●	●	●					●		●			●		
Water treatment		●	●			●	●		●			●		●					
Sludge/Sewage			●									●		●					
NRW/DMAs		●	●		●	●						●		●			●		
Irrigation	●	●				●	●		●		●	●		●	●	●	●	●	●
General Industry																			
Chemical	●		●					●		●	●	●	●	●				●	
Pulp & Paper			●									●		●					
Food & Beverages		●	●					●		●			●						
Dosing/Batching			●					●		●	●	●	●	●					
Filling machines		●	●					●		●			●						
HVAC	●	●	●	●					●			●		●	●	●		●	

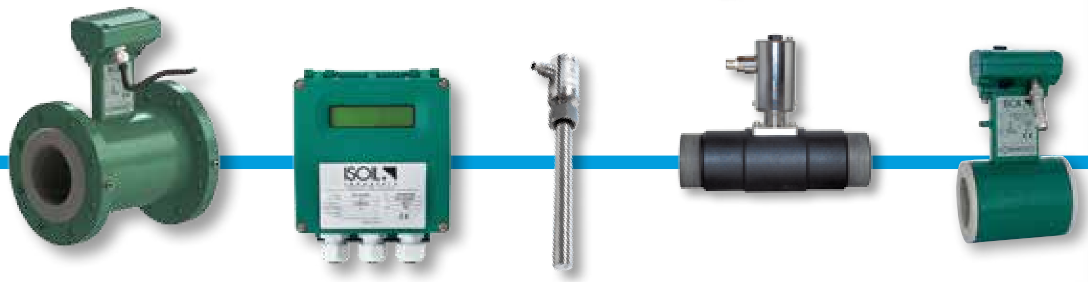
WATER & WASTEWATER

GENERAL INDUSTRY



FOOD & BEVERAGES

HVAC



Note: the above are the suggested combinations. For any particular application please contact your local distributor.

CUSTODY TRANSFER & BULK METERING

The OIML R49 recommendations and the European Directive 2004/22CE set out the conditions to which water meters shall comply to meet the requirements of the services of legal metrology in Countries where these instruments are subject to state controls.
The measuring range of the water meter is determined by Q3 (nominal flow rate) and "R" (ratio).

CERTIFIED MID MI001

MS 2500 sensor coupled to ML 210 or ML 110 or ML 255 converters are suitable for custody transfer.

Lining materials used on Isomag® sensors are suitable for drinking water and conform to **NSF** and/or **WRAS**.

	SENSOR SIZE											
	mm	**25**	**32**	**40**	**50**	**65**	**80**	**100**	**125**	**150**	**200**	**250**
	inch	*1*	*1¼*	*1½*	*2*	*2½*	*3*	*4*	*5*	*6*	*8*	*10*
Q3	m^3/h	**16,00**	**25,00**	**40,00**	**63,00**	**100,00**	**160,00**	**250,00**	**400,00**	**630,00**	**1000,00**	**1600,00**
Q1, R=100	m^3/h	0,16	0,25	0,40	0,63	1,00	1,60	2,50	4,00	6,30	10,00	16,00
Q1, R=400	m^3/h	0,04	0,06	0,10	0,16	0,25	0,40	0,63	1,00	1,58	2,50	4,00

Q2/Q1 = 1,6 Q4/Q3 = 1,25

FLOW METERS FOR HEAT CALCULATION

MS 2500 sensors coupled to ML 210 or to ML 110 converters are certified according to European Directive 2004/22CE category

CERTIFIED MID MI004

MI-004, and can be used in e system for heat calculation for billing purpose.

	SENSOR SIZE										
	mm	**25**	**32**	**40**	**50**	**65**	**80**	**100**	**125**	**150**	**200**
	inch	*1*	*1¼*	*1½*	*2*	*2½*	*3*	*4*	*5*	*6*	*8*
q_i	m^3/h	0,16	0,25	0,4	63	100	160	250	400	630	1000
q_p (10 m/s)	m^3/h	16	25	40	63	100	160	250	400	630	1000

Available q_p/q_i: 10 - 25 - 50 - 100 (flows in table are referred to MC100)

TEST BENCH AND ISO17025 CALIBRATION LABORATORY

Isoil flow meters are tested on ISO 17025 certified benches when leaving the factory, the original accuracy can be granted for years when the meter is working within its specifications.

Thanks to the Accredited Calibration Laboratory named Libra, conforming to UNI EN ISO/IEC 17025 standard (ACCREDIA CERTIFICATE LAT 237), Isoil can offer Calibration service for liquid flow meters for any type of flow meters in volume and volumetric flow. Currently on the 7 testing lines benches can be calibrated sensors up to DN800, the eighth line for bigger diameters is under construction.

Production Center and Warehouse.

Information shown in this brochure are not exhaustive, for detailed characteristics refer to individual data sheet.

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL
= ISO 9001 =

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ISOMAG®
The friendly magmeter